

Floriana PETRONE, Ph.D.

Postdoctoral Research Associate
Lawrence Berkeley National Laboratory
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EDUCATION

Ph.D in Structural Engineering, Sapienza University of Rome, Italy (2013)

M.S. in Construction Engineering (with honors) – Structural Design, Polytechnic University of Bari, Italy (2008)

B.S. in Construction Engineering (with honors), Polytechnic University of Bari, Italy (2006)

RESEARCH EXPERIENCE

Postdoctoral Research Associate

- Lawrence Berkeley National Laboratory - *Energy Geosciences Division, Berkeley (CA), USA (September 2015 - present)*
Development of a computational framework for the nonlinear seismic analysis of nuclear facilities and systems of the Department of Energy. Analyst for the development of a Finite Element code for Soil Structure Interaction analysis.
- University of California, Davis - *Department of Civil and Environmental Engineering, Davis (CA), USA (August 2014 – July 2015)*
Analysis and modeling of reinforced concrete and composite structures; development of numerical models for nonlinear large deformation analysis of reinforced concrete and hybrid systems; Finite Element Modeling (LS-Dyna, Abaqus, OpenSees) for nonlinear dynamic analyses of reinforced concrete and steel structures.
- University of California, Davis - *Department of Civil and Environmental Engineering Davis (CA), USA (August 2013 – July 2014)*, Sapienza University of Rome - *Department of Structural and Geotechnical Engineering, Rome, Italy (November 2013 – October 2014)* – joint appointment.
Analysis and modeling of composite structures; planning and management of an experimental campaign on composite beams; development of analytical models for composite beams in shear. Parallel research on Seismic Isolation Systems, focused on the study of Friction Pendulum bearings and calibration methods and stochastic analysis for structural safety assessment.

Visiting Scholar

Transatlantic Partnership for Excellence in Engineering - Department of Civil and Environmental Engineering, University of California at Davis, Davis (CA), USA (August 2012 – February 2013)

Professional Consulting - Research Contracts

Sapienza, University of Rome - Department of Structural and Geotechnical Engineering (September 2011 – May 2012); Politecnico di Bari, Department of Environmental Engineering and Sustainable Development, Taranto, Italy (February 2011 – September 2011); Politecnico di Bari, Department of Environmental Engineering and Sustainable Development, Taranto, Italy (July 2010 – January 2011); Politecnico di Bari, Department of Science of Civil Engineering and Architecture – ICAR, Bari, Italy (January 2010 – February 2010)

RESEARCH INTERESTS

Analysis and advanced numerical modeling of reinforced concrete and composite structures; calibration methods and stochastic analysis for structural safety assessment; Finite Element Modeling (LS-Dyna, Abaqus, OpenSees) for nonlinear dynamic analyses; Seismic Isolation Systems.

PUBLICATIONS

Journal papers (published)

- Monti, G. and **Petrone, F.** (2016). "Test-Based Calibration of Safety Factors for Capacity Models." *J. Struct. Eng.*, 10.1061/(ASCE)ST.1943-541X.0001571, 04016104.
- **Petrone, F.**, Bissonnette, N., Higgins, P., Kanvinde, A., (2016), "The Cross-aisle Seismic Performance of Storage Rack Base Connections", *Journal of Constructional Steel Research*, V. 122, pp. 520-531.
- **Petrone, F.**, Li, S., Kunnath, S., (2016) "Modeling of RC Frame Buildings for Progressive Collapse Analysis", *International Journal of Concrete Structures and Materials*, 10(1), pp. 1-13, DOI 10.1007/s40069-016-0126-y
- Monti, G., **Petrone F.**, (2015). "Analytical Thermo-mechanics 3D Model of Friction Pendulum Bearings", *Earthquake Engineering & Structural Dynamics*, DOI: 10.1002/eqe.2693
- Monti, G. and **Petrone, F.** (2015). "Yield and Ultimate Moment and Curvature Closed-Form Equations for Reinforced Concrete Sections." *ACI Structural Journal*, V. 112, No. 4, July-August 2015.
- Monti, G. and **Petrone, F.** (2015). "Shear Resisting Mechanisms and Capacity Equations for Composite Truss Beams." *J. Struct. Eng.*, V. 141, No. 12, December 2015.
- **Petrone, F.**, Monti G., (2014). "FRP-RC beam in shear: mechanical model and assessment procedure for pseudo-ductile behavior". *Polymers*, V. 6, No.7, 2051-2064.
- Trentadue, F., Mastromarino, E., Quaranta, G., **Petrone F.**, Monti, G., Marano G.C., (2014) "Bending Stiffness of Truss-Reinforced Steel-Concrete Composite Beams", *Open Journal of Civil Engineering*, V. 4, No.3, 285-300.
- Marano G.C., Trentadue F., **Petrone F.**, (2014) "Optimal arch shape solution under static vertical loads", *Acta Mech* 225, 679–686.
- Trentadue F., Quaranta G., **Petrone F.**, Marano G.C., and Monti G., (2011). "Structural design of composite concrete-steel beams with spatial truss reinforcement elements", *Asian journal of civil and engineering (building and housing)* V. 12, No. 2, 157-176.

Patents

- **Petrone F.** et al., (2011), "Structural node for steel-concrete composite truss joint" Application No.11425262.0, European Patent No.1255 October 28
<http://google.com/patents/EP2586925A1?cl=en&hl=it>

- **Petrone F.** et al., (2011), "Non-self-supporting steel truss for mixed steel-concrete truss systems" Application No.11425264.6, European Patent No.1255 October 28
<http://google.com/patents/EP2586927A1?cl=en&hl=it>
- **Petrone F.** et al., (2011), "Self-supporting steel truss for mixed steel-concrete truss systems" Application No.11425263.8, European Patent No.1255 October 28
<http://www.google.com.ar/patents/EP2586924B1?cl=en>

Book chapters

- **Petrone F.** et al., (2016), "Strengthening and retrofitting of existing structures" - Strengthening of RC Buildings with Composites (Chapter 3). Submitted
- **Petrone, F., et al.** (2016), "Design by Testing and Statistical Determination of Capacity Models" (Chapter 2) in C. Pellegrino and J. Sena-Cruz (eds.) *Design Procedures for the Use of Composites in Strengthening of Reinforced Concrete Structures*, RILEM State-of-the-Art Reports 19, pp. 5-38, Springer, Netherlands.
- **Petrone, F., et al.** (2016), "Shear Strengthening of RC Elements by Means of EBR FRP Systems" (Chapter 4) in C. Pellegrino and J. Sena-Cruz (eds.) *Design Procedures for the Use of Composites in Strengthening of Reinforced Concrete Structures*, RILEM State-of-the-Art Reports 19, pp.97-130, Springer, Netherlands.

Contributions to national/international conferences

- Wong, J., **Petrone, F.**, McCallen, D., McKenna, F., (2016) "Nonlinear computational simulations for the earthquake response of nuclear systems" 10th Nuclear Plants Current Issues Symposium, Charlotte, North Carolina, USA, December 11-14
- **Petrone, F.**, Wong, J., McCallen, D., McKenna, F., (2016) "Development of Advanced Numerical Tools for the Nonlinear Seismic Analysis of Nuclear Systems", 2016 ANS Winter Meeting and Nuclear Technology Expo, American Nuclear Society, November 6-10, Las Vegas (NV), USA.
- **Petrone, F.**, Wong, J. and Abell, J., (2016) "A Modern Computational Framework for Nonlinear Seismic Analysis of Nuclear Facilities and Systems", Poster Presentation, 2016 PEER Annual Meeting, January 28-29, Berkeley (CA), USA.
- Monti, G., **Petrone, F.**, Biondi, B., (2015) "Effects of Friction Pendulum Modeling on the Seismic Performance of Isolated Buildings", SNU-HNU Bi-lateral Workshop on Structural Behavior under Extreme Loads (SBEL 2015) - Sep. 27-30, Changsha, Hunan, China.
- Shan, L., **Petrone, F.**, Kunnath, S., (2015) "Energy-Based Damage Index for Progressive Collapse Evaluation of RC Structures under Extreme Loads", SNU-HNU Bi-lateral Workshop on Structural Behavior under Extreme Loads (SBEL 2015) - Sep. 27-30, Changsha, Hunan, China.
- Kareemi, M.A., **Petrone, F.**, Monti, G., "Experimental Tests on Composite Steel-Concrete Truss Beams", Conference ACE (Advances in Civil Engineering), June 12-13, 2015, Vietri sul Mare, Italy.
- Kunnath, S.K., **Petrone, F.** and Shan, L., Modeling and Simulation of Progressive Collapse of Reinforced Concrete Frame Buildings, The 6th International Conference of Asian Concrete Federation, 21-24 September, 2014, Seoul, Korea.
- **Petrone, F.**, Liotta, M., Monti, G., Marano, G. C., Trentadue, F., "Studio sperimentale per la valutazione del contributo del calcestruzzo nella resistenza a taglio delle travi reticolari miste". In: Braga, F., Mezzina, M. (Eds.), Proceedings of the 14th Conference of the Italian National Association of Earthquake Engineering, September 2011, Bari (Italy).
- **Petrone, F.**, (2009) "About the diagnostics of crack patterns with the Load Path Method", Master's thesis poster presentation, ASS.I.R.C.CO. Bari, Italy.

RESEARCH GRANT/AWARDS

- Co-investigator, POR Puglia, European funding 2007IT051PO005, 2011 research project (19,000 Euro) "Innovative Structural Element for the Industrialization of the Construction Process".
- TEE (Transatlantic Partnership for Excellence in Engineering) Fellowship

TEACHING EXPERIENCE

- UC Davis Ph.D. student, research work supervisor (2013-2016)
- UC Davis, Undergraduate students, tutor (2013-2015)
- "Tullio Levi Civita" foundation, Cisterna di Latina (Italy), Structural analysis lecturer. (2012)

ACADEMIC SERVICE

Editorial Committee

- Liotta M.A., **Petrone F.** Editorial Committee, Monti G., Editor, OpenSees Days Italia, 2012 Conference Proceedings
- Marano G.C., Monti G., **Petrone F.** editors of "Beams with spatial truss reinforcement in seismic design", Italian National Association of Earthquake Engineering, ANIDIS October 2011

Reviewer for

ASCE Journal of Structural Engineering, ACI Structural Journal, Advances in Structural Engineering

PROFESSIONAL AFFILIATIONS

- International Union Laboratories and Experts in Construction Materials, Systems and Structures - RILEM, Affiliate member
- Earthquake Engineering Research Institute (EERI), Member

PROFESSIONAL DEVELOPMENTS

- Professional Engineer, No. 9273
- Certificate of completion for "Structural design and building site management for rehabilitation of historical buildings", ASS.I.R.C.CO. May 2009. Bari, Italy.
- Certificate of completion for "I Advanced Course in Structural Engineering of Existing Buildings", CISEM, October 2008 – December 2008, Bari, Italy

Berkeley, July 2016

Floriana Petrone